

v7.0



Proton Precession

Magnetometer / Gradiometer / VLF (GSM-19T v7.0)

The new v7.0 system is the industry's latest innovation in proton precession design - with many new technologies that deliver significant benefits for earth science applications.

Key technologies include:

Data export in standard XYZ (i.e. line-oriented) format for easy use in standard commercial software programs

Programmable export format for full control over output

GPS elevation values provide input for geophysical modeling

Enhanced GPS positioning resolution
<1.5m standard GPS for high resolution surveying
<1.0m OmniStar GPS
<0.7m for newly introduced CDGPS

Multi-sensor capability for advanced surveys to resolve target geometry

Picket marketing / annotation for capturing related surveying information on-the-go

And all of these technologies come complete with the most attractive savings and warranty in the business!



GSM-19T Proton Precession console with sensor and cable. Can also be configured with additional sensor for gradiometer(simultaneous) readings.

For earth science survey groups who require a complete solution for end-to-end magnetic data acquisition at an affordable price, the GSM-19T proton precession family is the proven choice - for even the most challenging environments.

From robust field units to efficient survey modes to fast data downloading, the GSM-19T is carefully designed to deliver the maximum value in a proton precession system.

The GSM-19T also provides numerous technologies that differentiate it from other systems. For example, it is the only proton precession system with **integrated GPS** (optional) for high-sensitivity, accurately-positioned ground surveys.

With other v7.0 upgrades, GEM's proton precession system also leads in sensitivity, memory, base station technology, and other key areas.

Designed From the Ground Up

Leading the list of advances is GEM's rover unit which features a 25% increase in **sensitivity** -- reflecting new processing algorithms and implementation of the latest RISC microprocessors.

In addition, v7.0 **standard memory** is 16 Mbytes (expandable in 16 Mybte increments) which translates into 738,769 readings of line / station data or more than 2,708,821 readings for base station units.

The new memory capacity sets an industry standard, but more importantly, it means that operators can now handle even the largest surveys with ease.

Another important innovation is GEM's unique **programmable base station** which you can enable via either a field unit or a *Personal Computer* as follows:

Daily scheduling (define working hours and minutes each day). This mode provides economy of memory and battery usage on a daily basis.

Flexible scheduling (up to 30 on / off periods). Simply define a series of intervals and the base station will turn itself on as you need. This mode provides the greatest flexibility for longer surveys where leaving your base station running increases efficiency.

Immediate start. This mode is the traditional mode of starting a base station unit and leaving it until the operator can return to turn off the unit.

Survey Planning and Efficiency

One of the traditional challenges in ground magnetometer / gradiometer surveys is ensuring that surveys are designed and implemented as effectively as possible.

With the v7.0 proton precession system, GEM addresses this challenge through



standard GEM capabilities, such as the Walking Mag option that enables the operator to sample while walking. Though there is some increase in noise, many users find this is balanced by improved field productivity. Having nearly continuous data on survey lines also helps increase the accuracy of interpretations.

Another innovation is GPS way **point pre-programming**. Now you can define a complete survey in the office on your Personal Computer and download this information directly to a rover unit via RS-232. Then, the operator simply performs the survey using the points as their survey guide -- with a resulting decrease in errors and more rapid survey completion.

Survey Operations

The GSM-19T also helps the operator on a daily basis while performing surveys. A key feature is the **easy-to-read LCD** data display in graphical (or text) format along with a signal quality indicator to determine when readings need to be repeated.

And, although GEM's proton precession unit is very tolerant to gradients, it also provides a warning indicator so that the operator can monitor data quality continuously. Other features operators appreciate include easy-to-use line and station incrementing -- as well as end-of-line indicators.



Fast Data Transfer

Another traditional area in which time is lost in surveys is in data transfer. In v7.0, GEM addressed this in several ways:

Data download is tripled to 115 KBaud (fastest rate possible with RS-232).

PC-based data reduction is now possible using an upgraded version of GEMLinkW, GEM's proprietary data transfer software.

GPS and Other Software

GEM Systems recently became the only manufacturer to provide a **fully integrated** GPS option for its line of proton precession products. Along with metre to sub-metre positioning options, the new processing functionality enables users to take advantage of the benefits of GPS.

Some of the capabilities include:

Pre-programming of way points.

Post-processing of GPS data. GEM's DGPS option enables transfer of GPS data for post-processing and merging via 3rd party software.

Precise **time synchronization** of field and base station units. This capability is particularly important for working in noisy magnetic conditions and provides the highest accuracy possible.

In addition to its own software, GEM is also pleased to offer a variety of data analysis and processing software from 3rd party developers.

Ongoing Maintenance and Support

As a potential user of a GSM-19T system -- the industry's end-to-end magnetometer / gradiometer solution -- you should also know that we stand by our technologies, products and services.

With a 25-year record of success and new innovations -- plus **Internet-based upgrades** that keep your system up-to-date and our ongoing support -- we believe that you will find that GEM offers the best solution in proton precession units today.

GEM Systems, Inc.
52 West Beaver Creek Road, 14
Richmond Hill, ON
Canada L4B 1L9
Tel: 905-764-8008
Fax: 905-764-2949
Email: info@gemsys.ca
Web: www.gemsys.ca

Specifications

Performance

Sensitivity:	0.1 nT @ 1 Hz
Resolution:	0.01 nT
Absolute Accuracy:	1 nT (+/- 0.5 nT)
Dynamic Range:	20,000 to 120,000 nT
Gradient Tolerance:	Over 7000 nT/m
Sampling Rate:	1 reading per 3 to 60 sec
Operating Temperature:	-40C to +60C

Operating Modes

Manual: Coordinates, time, date and reading stored automatically at minimum 3 second interval.

Base Station: Time, date and reading stored at 3 to 60 second intervals.

Remote Control: Optional remote control using RS-232 interface.

Input / Output: RS-232 or analog (optional) output using 6-pin weatherproof connector.

Storage - 16 MB (# of Readings)

Mobile:	738,769
Base Station:	2,708,821
Gradiometer:	625,112
Walking Mag:	1,354,410

Dimensions

Console:	223 x 69 x 240mm
Sensor:	170 x 71mm diameter cylinder

Weights

Console:	2.1 kg
Sensor and Staff Assembly:	2.2 kg

Standard Components

GSM-19T console, GEMLinkW software, batteries, harness, charger, sensor with cable, RS-232 cable, staff, instruction manual and shipping case.

Optional VLF

Frequency Range: Up to 3 stations between 15 to 30.0 kHz

Parameters: Vertical in-phase and out-of-phase components as % of total field. 2 relative components of the horizontal field.

Resolution: 0.1% of total field

